

Logic for Applications (Second edition). By Anil Nerode and Richard A. Shore. Springer, New York. (1997). 456 pages. DM 78.00, öS 569.40, sFr 69.00.

Contents:

Preface. Introduction. I. Propositional logic. 1. Orders and trees. 2. Propositions, connectives and truth tables. 3. Truth assignments and valuations. 4. Tableau proofs in propositional calculus. 5. Soundness and completeness of tableau proofs. 6. Deductions from premises and compactness. 7. An axiomatic approach. 8. Resolution. 9. Refining resolution. 10. Linear resolution, Horn clauses and PROLOG. II. Predicate logic. 1. Predicates and quantifiers. 2. The language: Terms and formulas. 3. Formation trees, structures and lists. 4. Semantics: Meaning and truth. 5. Interpretations of PROLOG programs. 6. Proofs: Complete systematic tableaux. 7. Soundness and completeness of tableau proofs. 8. An axiomatic approach. 9. Prenex normal form and Skolemization. 10. Herbrand's Theorem. 11. Unification. 12. The unification algorithm. 13. Resolution. 14. Refining resolution: Linear resolution. III. PROLOG 1. SLD—Resolution. 2. Implementations: Searching and backtracking. 3. Controlling the implementation: Cut. 4. Termination conditions for PROLOG programs. 5. Equality. 6. Negation as failure. 7. Negation and nonmonotonic logic. 8. Computability and undecidability. IV. Modal logic. 1. Possibility and necessity; knowledge or belief. 2. Frames and forcing. 3. Modal tableaux. 4. Soundness and completeness. 5. Modal axioms and special accessibility relations. 6. An axiomatic approach. V. Intuitionistic logic. 1. Intuitionism and constructivism. 2. Frames and forcing. 3. Intuitionistic tableaux. 4. Soundness and completeness. 5. Decidability and undecidability. 6. A comparative guide. VI. Elements of set theory. 1. Some basic axioms of set theory. 2. Boole's algebra of sets. 3. Relations, functions and the power set axiom. 4. The natural numbers, arithmetic and infinity. 5. Replacement, choice and foundation. 6. Zermelo-Fraenkel set theory in predicate logic. 7. Cardinality: Finite and countable. 8. Ordinal numbers. 9. Ordinal arithmetic and transfinite induction. 10. Transfinite recursion, choice and the ranked universe. 11. Cardinals and cardinal arithmetic. Appendices. A. An historical overview. 1. Calculus. 2. Logic. 3. Leibniz's dream. 4. Nineteenth century logic. 5. Nineteenth century foundations of mathematics. 6. Twentieth century foundations of mathematics. 7. Early twentieth century logic. 8. Deduction and computation. 9. Recent automation of logic and PROLOG. 10. The future. B. A genealogical database. Bibliography. Index of symbols. Index of terms.

Selected Papers S. Chandrasekhar. Volume 7: The Non-Radial Oscillations of Stars in General Relativity and Other Writings. University of Chicago Press, Chicago. (1997). 294 pages. \$99.00, £79.25 (cloth); \$45.00, £35.95 (paper).

Contents:

I. The non-radial oscillation of stars. Foreword (Valeria Ferrari). 1. On the non-radial oscillations of a star (with V. Ferrari). 2. On the non-radial oscillations of slowly rotating stars induced by the lense-thirring effect (with V. Ferrari). 3. On the non-radial oscillations of a star. II. Further amplifications (with V. Ferrari and R. Winston). 4. On the non-radial oscillations of a star. III. A reconsideration of the axial modes (with V. Ferrari). 5. On the non-radial oscillations of a star. IV. An application of the theory of Regge poles (with V. Ferrari). 6. On the non-radial oscillations of a star. V. A fully relativistic treatment of a Newtonian star (with V. Ferrari). 7. The Einstein pseudo-tensor and the flux integral for perturbed static space-times (with V. Ferrari). 8. On spherical free gravitational waves (with V. Ferrari). II. Other writings. Foreword (Lalitha Chandrasekhar). 9. The series paintings of Claude Monet and the landscape of general relativity. 10. The perception of beauty and the pursuit of science report presented at the 209th annual meeting of the American Academy of Arts and Sciences, 10 May 1989. 11. The case of astronomy. 12. Ellipsoidal figures of equilibrium—An historical account. 13. Why are stars as they are? 14. The role of general relativity in astronomy. 15. Hydrodynamic stability and turbulence (1922–1948): An annotation. 16. On reading Newton's *Principia* at age past eighty. 17. Newton and Michelangelo. 18. Daniel Chalonge and the problem of the abundance of hydrogen opening address, first course of the International School of Astrophysics "D. Chalonge," Erice, 1–8 September 1991. 19. To Victor Ambartsumian on his eightieth birthday. 20. On the occasion of the Charles Greeley Abbot Award by the American Solar Energy Society. 21. Science and scientific attitudes. 22. C.T. Rajagopal (with André Weil). 23. On Ramanujan. 24. Reminiscences and discoveries: On Ramanujan's Bust). 25. Foreword to the issue dedicated to the memory of Meghnad Saha. 26. Indira Gandhi: Some recollections. 27. In memoriam: Jawaharlal Nehru. Acknowledgments.

Atlas for Computing Mathematical Functions: An Illustrated Guide for Practitioners, with Programs in C and Mathematica. William J. Thompson. John Wiley & Sons, New York. (1997). 903 pages. \$99.00 (CD included).

Contents:

Preface. Introduction. The atlas of functions. The computer interface. I. The functions. 1. Introduction to the functions. 2. A visual tour of the atlas. 3. Computing strategies. 4. Elementary transcendental functions. 5. Exponential integrals and related functions. 6. Gamma and beta functions. 7. Combinatorial functions. 8. Number theory functions. 9. Probability distributions. 10. Error function, Fresnel and Dawson integrals. 11. Orthogonal polynomials. 12. Legendre functions. 13. Spheroidal wave functions. 14. Bessel functions. 15. Struve, Anger, and Weber functions. 16. Hypergeometric functions and Coulomb wave functions. 17. Elliptic integrals and elliptic functions. 18. Parabolic cylinder functions. 19. Miscellaneous functions for science and engineering. II. The computer interface. 20. The *Mathematica* notebooks. 21. The C driver programs. Appendix. File names for PC-based systems. Indexes. Index of function notations. Index of programs and dependencies. Index of subjects and authors.